DEPARTMENT OF DEFENSE
Tel. Liberty 5-6700
Ext. 53801

U.S. ATOMIC ENERGY COMMISSION
Tel. HAselwood 7-7631
Ext. 3446

JOINT OFFICE OF TEST INFORMATION

FOR RELEASE IN

HEALTH AND SAFETY PRECAUTIONS
FOR ENIWETOK PROVING GROUND TESTS

Protection of health and safety is a primary consideration in the conduct of the HARDTACK series of nuclear weapons tests now underway at the Eniwetok Proving Ground in the Pacific.

As announced previously, the test series will advance the development of weapons for defense against aggression whether air-borne, missile-borne or otherwise mounted. Information on the effects of weapons will be obtained for military and civilian defense use. As in the past, test operations will be conducted in a manner designed to keep to an absolute minimum the radiation arising from the detonation of nuclear weapons .

An important objective of the tests is the further development of nuclear weapons with greatly reduced radioactive fallout so that the area of radiation hazard may be kept as small as possible. This principle was first proved in the Eniwetok test series of 1956.

Various precautions have been taken to keep significant radioactive fallout within the confines of the danger area in the Pacific which was announced on February 14, 1958. With the exception of Joint Task Force facilities, there are no inhabited places within the danger area.

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There is reason to expect that no significant fallout will occur outside the danger area, and it is highly unlikely that inhabitants of any island will have to be moved. However, plans have been made for transportation should such action have to be taken.

Extensive systems have been established to detect and measure radioactivity in the vicinity of the Proving Ground, in the United States, and in other parts of the world. Radiological monitoring and sampling will be conducted by several networks of stations extending from the Proving Ground to locations around the world. In addition marine surveys will be conducted to measure radioactivity in sea water and marine organisms.

More detailed information on health and safety measures relating to the test series follows:

Fallout Predictions

Tests will be conducted only when the forecast pattern of significant fallout is entirely within the danger area. In forecasting fallout patterns, scientists will make use of improved methods of collecting and evaluating data which have been developed as a result of intensive study of the problem of predicting fallout in the vicinity of the Proving Ground.

Fallout predictions are dependent upon weather information. Experience has shown that weather data normally available in the Pacific Ocean area are inadequate for the needs of testing. Therefore for nuclear tests in the Pacific special arrangements are made to obtain additional data. For the 1958 tests thirteen special United States weather stations, located within several hundred miles of the Proving Ground, will participate in a weather network reporting to a central station. These stations will be staffed by military and civilian

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meteorologists. Weather reconnaissance will be carried on employing aircraft, ships, balloons and rockets.

Research has been conducted in the special field of tropical meteorology, and weather observers and forecasters have been instructed in the latest methods of forecasting which have been developed as a result of these studies.

Trained personnel have been organized into a fallout prediction unit. To assist in predicting fallout patterns they will utilize fallout computers which mechanize most of the mathematical procedures involved. Use of the computers will make possible rapid forecasts. Models of the clouds produced by previous large-scale nuclear detonations have been developed, and these also are expected to improve fallout predictions.

Danger Area

The danger area is generally rectangular in shape and comprises roughly 390,000 square nautical miles. It is approximately the same size as the area used in the 1956 test series, but its east and west boundaries have been shifted approximately 120 nautical miles to the west. Except for the test personnel, there are no inhabitants within the area.

All ships, aircraft and personnel have been cautioned to remain clear of the area which is bounded by a line joining the following geographic coordinates:

18° 30' N.,	156° 00' E.
18° 30' N.,	170° 00' E.
11° 30' N.,	170° 00' E.
11° 30' N.,	166° 16' E.
10° 15' N.,	166° 16' E.
10° 15' N.,	156° 00' E.

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Notices have been given the widest possible distribution through marine, aviation and international organizations.

Regular air and sea searches of the area will be conducted in advance of the start of operations. Before each shot, the patrol of the danger area will be intensified, particularly in the area where fallout is forecast.

The Atomic Energy Commission has issued regulations which prohibit entry into the danger area of U. S. citizens and all other persons subject to the jurisdiction of the United States, its territories and possessions.

The regulations effective from April 11, 1958 until the HARDTACK test series is completed prohibit entry, attempted entry or conspiracy to enter the danger area.

Radiation Monitoring in Proving Ground Region

Radiological safety personnel, equipped with radiation detection and measuring instruments and two-way radios to enable them to communicate with the central Task Force Radiological Safety Office, will be stationed on nearby inhabited atolls, and at weather stations of the weather reporting network. In the unlikely event of significant fallout in an inhabited area, the monitors would warn the inhabitants and advise and assist them in taking safety measures. The monitors also have trained Marshallese medical practitioners and health aides in basic emergency measures.

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Radiation Surveys of Sea and Marine Life

Outside of the testing area, the detonations are not expected to add enough radioactive material to natural levels of radioactivity in the ocean to be harmful to marine life. Experience shows that outside the testing area, resulting quantities of radioactivity in edible sea foods will result in exposures which will be very small compared with the limits for public exposure recommended by the United States National Committee for Radiation Protection and Measurement.

As in the past there will be a program of study to explore the ultimate destination and behavior of radioactivity in the sea water and in marine organisms. Sweeps by U. S. Navy Vessels both during and after the test series will include such measures as taking continuous readings of radioactivity in surface water, sampling of water at various depths, making tows to gather plankton -- the tiny marine organisms which tend to concentrate radioactive materials in their tissues -- and catching of fish for analysis for radioactivity.

In addition to these investigations, land and marine biological surveys again will be conducted at Eniwetok and Bikini and other atolls nearby. Samples of water and of plants and animals living in the lagoons and on the reefs and islands of the atolls will be collected and analyzed for radioactivity.

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Fallout Monitoring in United States

The heavier particles fall out of the radioactive cloud at early times after a detonation, while their radioactivity is still high. Therefore, the highest levels of radioactivity occur over a local area downwind from the point of detonation. The area of significant fallout is expected to occur entirely within the uninhabited danger area surrounding the Eniwetok Proving Ground.

As the radioactive cloud is transported away from the point of detonation, it is widely dispersed by air currents and diluted by normal air. Its radioactivity also decreases rapidly because of the normal process of radioactive decay.[2] By the time the cloud from a detonation in the Eniwetok Proving Ground has traveled across a vast expanse of ocean, it will have become thoroughly dispersed into the air and will have lost most of its original radioactivity.

As a result, the exposures to radioactivity in the United States from the Eniwetok tests are expected to be low. Although levels of many times the normal background may be reached in some localities, these increases will be temporary and will not greatly increase the total exposure to radiation. Average exposures of residents of the United States to radiation from weapons tests during the past five years has been much less than the average exposure to radiation from natural sources during the same period.

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[2] Radioactive fallout consists of a mixture of radioisotopes, with varying half-lives. The mixture as a whole decreases in radioactivity in such a way that for every seven fold increase in age, the total radioactivity is decreased 10-fold. Thus, the radioactivity at seven hours after the H 1 hour is only one-tenth that at H + 1 hour, and in 49 hours is one-hundredth, etc.

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Outside of the Pacific area monitoring and sampling activities will be conducted in cooperation with the U. S. Weather Bureau, the U. S. Public Health Service, and at Atomic Energy Commission installations. These operations will not be conducted in the expectation of possible hazard, but for scientific purposes and to keep the public informed on levels of radioactivity.

Information will be provided by two monitoring networks, one consisting of 42 stations established by the U. S. Public Health Service and the other consisting of monitors at 11 Commission installations. The locations of these monitoring stations are in Tables I and II.

The Public Health Service established its country-wide monitoring system in 1956 in connection with the REDWING series of tests at the Commission's Eniwetok Proving Ground under a contract between the Public Health Service and the Commission the monitoring system will operate throughout the year.

The Public Health Service monitoring stations will take daily radiation readings and collect filter samples of radioactivity and will forward these to a central collection office in Washington. The stations also will report data to the Health Officers of the states or territories in which the stations are located.

They will be manned by trained technicians from state health departments, local universities and scientific institutions.

Still another network in the United States gathers data which is used in a long range scientific study of the behavior of radioactive materials in the environment and their effect on man. This network consists of 46 U. S. Weather Bureau and 8 Atomic Energy Commission stations which collect fallout samples at selected locations throughout the nation and its territories.

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Measurements of Radioactivity Outside the U.S.

Samples of airborne dust will be taken at approximately 70 localities throughout the world, in addition to the 46 U. S. stations. Previous studies of this kind have shown that the average gamma ray dosage delivered by all tests to date is much less than the dose from natural background radiation during the same period of time.

Soils also will be sampled on a world-wide basis, and samples of other materials such as milk and cheese, field crops and human and animal bones will be taken for analysis of their strontium-90 content. This program is part of the Commission's Project Sunshine, a study of the world-wide distribution and uptake of radio-active fission products, particularly strontium-90.

TABLE I

U. S. Public Health Service Monitoring Stations
During Operation HALFTACK

Albany, N. Y.	Honolulu, T. H.	Oklahoma City, Okla.
Anchorage, Alaska	Indianapolis, Ind.	Pascagoula, Miss.
Atlanta, Ga.	Iowa City, Iowa	Phoenix, Ariz.
Austin, Tex.	Jacksonville, Fla.	Pierre, S. Dak.
Baltimore, Md.	Jefferson City, Mo.	Ponca City, Okla.
Berkeley, Calif.	Juneau, Alaska	Portland, Oreg.
Boise, Idaho	Klamath Falls, Oreg.	Richmond, Va.
Cheyenne, Wyo.	Lansing, Mich.	Salt Lake City, Utah
Cincinnati, Ohio	Las Vegas, Nev.	Santa Fe, N. Mex.
Denver, Colo.	Lawrence, Mass.	Seattle, Wash.
El Paso, Tex.	Little Rock, Ark.	Springfield, Ill.
Gastonia, N. C.	Los Angeles, Calif.	Topeka, Kans.
Harrisburg, Pa.	Minneapolis, Minn.	Trenton, N. J.
Hartford, Conn.	New Orleans, La.	Washington, D. C.

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TABLE II

AEC Monitoring Stations
During Operation HARDTACK

Location	Agency
Albuquerque, New Mexico	Sandia Corporation
Berkeley, California	Radiation Laboratory, University of California
Cincinnati, Ohio	General Electric Company - Aircraft Nuclear Propulsion Department
Idaho Falls, Idaho	Idaho Operations Office
Lemont, Illinois	Argonne National Laboratory
Los Alamos, New Mexico	Los Alamos Scientific Laboratory
New York, New York	New York Operations Office
Richland, Washington	Hanford Operations Office
Oak Ridge, Tennessee	Oak Ridge National Laboratory
Rochester, New York	The Atomic Energy Project, University of Rochester
West Los Angeles, Calif.	Atomic Energy Project, UC-Los Angeles

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